University of Leeds), and it had also made large grants towards the establishment of technical schools at Bradford and Huddersfield; but the first great sign of the City Companies' new activity was the constitution of the City and Guilds of London Institute in 1876. It is impossible to trace here the development of this movement, in which Sir Owen Roberts took a leading part. Suffice it to say that, as a result of it, we now have at South Kensington the magnificent Imperial College of Science and Technology, which owes its existence in no small measure to the munificence of the City Companies.

Sir Owen's position as an educational authority was handsomely recognised when he was appointed one of the seven commissioners under the University of London Act, 1898, entrusted with the duty of reconstituting the University. Sir Owen has since confessed that in his opinion the problem of devising an internal university in London is incapable of a satisfactory solution; but he strove with his fellow-commissioners to do the utmost with the materials at their disposal, and for several years he continued loyally to serve the re-constituted university as a member of its Senate. It is probable that he was more completely satisfied with the work which he did at the Royal Society of Arts. One of the chief aims of that royal and ancient institution has, for the last century and a half, been to encourage industry by the application of science and art—precisely the object which Sir Owen had so much at heart. He was elected a member of the Society's council in 1880, and with the briefest break he continued to serve on it until his death. During nearly all this period he acted as Treasurer, and for one year as Chairman of the Council. He had a great grasp of finance, and to his sound advice is due in large measure the prosperity which the society at present enjoys.

Sir Owen will be missed by a very large circle of public and private friends. His genial personality and warm-hearted friendliness ensured him a welcome wherever he went, and he retained to the end a vigorous vitality that might well have been envied by many a man thirty years his junior.

NOTES.

THE council of the Geological Society has this year made the following awards of medals and funds:—Wollaston medal, Prof. T. W. Edgeworth David, C.M.G., F.R.S.; Murchison medal, Prof. W. W. Watts, F.R.S.; Lyell medal, Prof. E. J. Garwood, F.R.S.; Bigsby medal, Mr. H. H. Hayden; Prestwich medal, Prof. Emile Cartailhac (Toulouse); Wollaston Fund, Mr. C. B. Wedd; Murchison Fund, Mr. D. C. Evans; Lyell Fund, Mr. John Parkinson and Dr. L. Moysey; Barlow-Jameson Fund, Mr. J. G. Hamling.

DR. J. SCOTT KELTIE, secretary of the Royal Geographical Society, has been awarded the Cullum gold medal of the American Geographical Society, in appreciation of his services in the advancement of geographical knowledge. Arrangements are being made by the American Geographical Society, through the United States Department of State, for the presentation to be made to Dr. Keltie by the American Ambassador in London.

THE widow of Prof. Henry Draper, of Harvard, the American pioneer in stellar spectroscopy, died recently in New York. Mrs. Draper was herself one of her husband's most capable assistants in the Harvard College Observatory. On his death in 1882 she presented that institution with his eleven-inch telescope and provided the main funds for the preparation of the great "Draper Catalogue," recording the spectra of more than ten thousand stars, as a memorial to her husband. It is announced in the issue of *Science* for December 25 last that Mrs. Draper has, by her will, left large bequests for public purposes. She bequeaths 30,000*l.* to the Harvard College Observatory for the Draper memorial; her husband's photographic plates and apparatus are also bequeathed to the observatory. The sum of 90,000*l.* is given to the New York Public Library, 40,000*l.* for a memorial to Dr. John S. Billings, and 40,000*l.* as a memorial to her father, Courtland Palmer. The income of these funds is to be used for the purchase of books, and an additional trust fund of 10,000*l.* is given for the benefit of the employees of the library. There is also a bequest of 5000*l.* to the Smithsonian Institution, and of 5000*l.* to the laboratory of surgical research of New York University, of the medical department of which Dr. Henry Draper was at one time dean.

SOME indication of the cause of the severe floods which have of late been so prevalent in the Thames Valley and in other parts of the country can be gathered from the summary of rainfall issued in the Weekly Weather Reports of the Meteorological Office. In the five weeks ending January 2 the aggregate rainfall was largely in excess of the average in all parts of the United Kingdom. The greatest excess of rain occurred in the south-east of England, where the fall was 318 per cent. of the average. The next highest percentage is 284, in the east of England, followed by 246 in the midland counties. In the Channel Islands the rainfall was 223 per cent. of the average, and in the south-west of England it was 200 per cent. In all other districts the rainfall was less than double the normal, and in the west of Scotland it was only 131 per cent. of the average.

A SUMMARY of the weather issued by the Meteorological Office for the fifty-two weeks ended January 2 shows the aggregate conditions for 1914. The mean temperature for the year was in excess of the average in all parts of the British Isles. In the east and north-east of England and in the midland counties the mean temperature was 2° above the average, whilst in all other districts except the north and south of Ireland and the Channel Islands the excess amounted to 1°. The south-east of England was the only district with an absolute temperature of 90°, but the thermometer exceeded 80° in all other districts. The lowest temperature was 7° in the east of Scotland. The rainfall for the year was largest in the north of

Scotland, where the amount was 49·31 in., and it was least in the north-east of England with 24·82 in. The only districts with an appreciable deficiency of rain were the west and north of Scotland, where the percentage of the average rainfall was respectively 91 and 94. In the south-east of England the aggregate rainfall was 125 per cent. of the average, which is the highest difference from the normal, in the Channel Islands it was 121 per cent. of the average, in the south-west of England 119, in the south of Ireland, 111, in the midland counties 109, and in the east of England 108 per cent. In no other district was the rainfall more than 104 per cent. of the average. The rainy days were not generally very different from the normal. There was a slight excess of sunshine in the eastern districts, whilst the western districts were mostly in agreement with the average.

A FEW weeks ago we announced with regret the death in Cambridge, on December 9, of Prof. A. van Gehuchten, professor of the anatomy, pathology, and treatment of diseases of the nervous system in the University of Louvain. Sir Clifford Allbutt, in two short communications to the Educational Supplement of the *Times* (January 5) and the *British Medical Journal* (December 26) expressed the grief of many friends at Cambridge, as well as of biologists generally, at the loss which science has sustained by Prof. van Gehuchten's death. To these sources, and an appreciative obituary notice contributed by Dr. F. E. Batten to the latter journal, we are indebted for the following details. In 1887, after a brilliant career as a student under the late Prof. J. B. Carnoy, and in laboratories at Berlin and Frankfurt, van Gehuchten returned, at the age of twenty-six, to Louvain, where he had been appointed instructor in anatomy, especially in the field of neurology, of which subject he became one of the most original investigators and exponents of our time. During twenty-four years the records of his now famous researches into the nervous system appeared in a series of papers in which each challenged the others in interest and importance. His researches dealt especially with the unit of modern neurology—the neuron; with the origin and causes of the motor nerves; the pathology of certain virulent nervous maladies; the phenomena of normal and morbid reflexes; and incidentally but very effectively with the development of methods. It was in 1897 that he began his long and fruitful series of study on methylene-blue staining methods, a report on which he presented to the International Congress of Medicine at Moscow in that year.

A REMARKABLE human skeleton, discovered by Dr. Hans Reck in the Oldoway ravine in German East Africa, is described in the *Antiquary* for January, by Mr. J. Reid Moir. In the layer resting immediately upon the basal basaltic lava, rhinoceros bones were discovered, and in the overlying deposit, that in which the human remains were found, a great number of elephant bones, differing from the present-day African elephant, and a splendid hippopotamus skull were unearthed. Dr. Reck believes that it is impossible to imagine that this skeleton attained its position in the deposit in which it was found otherwise than during its normal accumulation, and that any idea of an artificial grave having been dug into this stratum is untenable. If these facts be accepted, the remains seem to belong to the Pleistocene period. They do not represent a very early or primitive type, and they thus present a close analogy to the celebrated Ipswich man. The obvious conclusion is that man must have been developed at a period much earlier than is generally supposed. But before this startling conclusion is accepted we must have much more precise details of the geological age of the stratum in which the remains were found. A decision on the question may safely be deferred until Dr. Reck's detailed report is available for study.

PROF. FLINDERS PETRIE contributes to *Ancient Egypt*, part i. of 1915, a valuable article on metals in Egypt, in which he brings together all the available information on the use of copper, gold, silver, lead, tin, bronze, and iron. The account of iron is particularly instructive. First, we have the sporadic Iron Age, beginning with the Gerzeh beads and the well-known piece of sheet iron from the pyramid of Khufu at Gizeh. Incidentally, we are told that the supposition that iron might disappear in course of time is a fallacy. A lump of oxide of iron is practically insoluble when buried, and its strong colouring and staining power make it very obvious. The developed Iron Age in Egypt began about 1200 B.C., whereas in Assyria, iron, as a tribute from the Chalybes, dates from 881 B.C. An Ethiopian source for the Egyptian iron may be discarded, as, if it were common there, it would soon have reached Egypt at a very early date; but the Ethiopian slag-heaps are not earlier than the general special culture of that region, which began in the XXVth dynasty, and continued from 700 B.C. onwards. The sources of the European and Euphratean iron would be quite sufficient to account for the general use of iron in Egypt, even apart from the Ethiopian.

THE picture-film entitled "The Escape," exhibited by Messrs. Ruffell, at the Alhambra Theatre, on Tuesday, possesses scientific interest. Apparently an ordinary melodrama of low life, with an exceptionally well-ordered and pictured scenario, it is designed for educational purposes in eugenics. Many of Zola's and de Maupassant's novels and stories might be thus eugenically underlined. The kinematograph has already done good educational work, *e.g.* in botany and general biology, and there is no reason why it should not develop its usefulness all round the educational field. A long view and some imagination are needed if the average person is to draw the eugenic moral from tragedies of everyday life, but a picture-film interspersed with explanatory mottoes, easily remembered, is a real educative force. The drama deals largely with evil conditions imposed by heredity and environment. A connection is made between them and criminal behaviour, operating both in the home and in public. Selfish luxury is exposed as well as selfish brutality, and the effects on the new generation of the nation's men and women are vividly indicated. A picture-play like this should help many to visualise the scientific reality behind domestic happenings seen daily but ignored.

WE have received a report of a bacteriological examination of the milk supply of Montreal in 1913–14, by Dr. F. C. Harrison and Messrs. A. Savage and W. Sadler. A large number of analyses were carried out on more than 1000 samples, and the averages show that Montreal milk, both in summer and in winter, is of very poor hygienic quality. Various recommendations are made with the view of improving the supply.

IT is shown by Mr. E. Shaw, in the *Victorian Naturalist* for November, 1914, that two supposed species of Australian cockroaches were founded in 1893 on females of a species named in 1869 from males, and representing a genus apart from that to which the two former were assigned.

IN the *American Museum Journal* for December, 1914, Mr. R. C. Andrews records the history of the magnificent collection of whales, porpoises, and dolphins which has recently been brought together in the American Museum, and in the acquisition of which he himself has taken a very large share, having visited whaling-stations in Vancouver, Alaska, Japan, and various Pacific isles, as well as having harpooned white whales during their annual rush up the St. Lawrence. The descriptions of the capture and flensing of the monsters are most vivid, while many of the illustrations are of the greatest interest.

THE Report of the Marine Biological Station at Port Erin for 1914 contains a summary of the investigations carried on at the station during the year. Nearly nine million plaice eggs were dealt with in the fish hatchery, of which number about eight million were successfully hatched and the larvæ liberated at an early stage of development. Experiments in lobster rearing were also carried on. Out of 24,500 eggs placed in the hatching boxes, 1823 larvæ were reared to the fourth or "lobsterling" stage. The regular collection of plankton from Port Erin Bay was continued. Biochemical researches on the nutrition and metabolism of marine animals were carried on by Prof. B. Moore and other workers, and various biological researches were also undertaken.

IN revising the water-beetles of the group typified by the genus Helophorus in the January issue of the *Entomologist's Monthly Magazine* (the first number of the fifty-first volume and of a nominal third series), Dr. D. Sharp takes occasion to express his objection to the practice of prefixing the letter "H" to derivatives from Greek aspirated words, on the ground that the Greeks did not indicate the aspirate by a letter, and arranged the aspirated and silent vowels in a single alphabetical series. To omit the "H" would, however, destroy all clue to the origin of the words, and in certain instances might lead to difficulty; as, for example, if there were a derivative from *ὄρος*, a mountain, analogous to horizon, from *ὅρος*, a boundary. In another article Dr. J. Waterston describes two new species of bird-lice (Mallophaga), representing as many genera, from a Colombian toucan.

Tropical Life for December contains a well-illustrated supplement entitled "Panama and Prosperity," with numerous illustrations of tropical products reproduced from excellent photographs. Coco-nut germination, the picking and curing of cacao, the sugar cane industry, lime-growing, and tobacco in Jamaica are among the subjects illustrated, and should prove of value to those interested in tropical vegetation.

IN the *Kew Bulletin*, No. 9, a new oil seed from South America, *Osteophleum platyspermum*, Warb., is described and figured, and an analysis given of the kernel, which contained 55·2 per cent. of fat. Other members of the Myristicaceæ are known to yield yellowish fats containing a large proportion of the glyceride of myristic acid. These seeds, could they be imported in sufficient quantity, would be valuable for commercial purposes.

THE Report of the Botanic Station in the Virgin Islands for 1913–14, just received, shows that in these small islands, as in the larger islands under the jurisdiction of the Imperial Department of Agriculture for the West Indies, important work is being done in the improvement of the cultivated crops. The cotton industry, in particular, is well-fostered, and the usefulness of the station is shown by the large demands received for coco-nuts, coffee plants, bay plants, etc. Special attention is being paid to the coco-nut industry, and its progress will be eagerly watched, especially by those owning land in the islands.

THE Annotated List of Flowering Plants and Ferns of Point Pelee, Ontario, forming Memoir 54 of the Biological Series, Department of Mines, Canada, is a useful compilation, since Mont Pelee lies on a direct line of north and south bird migration. The object of the paper is to throw light on bird migration and also to add to the knowledge of the distribution of the wild plants of Ontario and Michigan. 583 species of plants were noted on the point. On Pelee Island, a large island to the south in Lake Erie, the Kentucky coffee tree and other plants reach their northern limit. It is unfortunate that Mr. Dodge does not summarise his results or draw any conclusions as to the dispersal of the plants by migratory birds.

THE "Fern ledges" of St. John, New Brunswick, form the subject of Memoir 41 of the Geological Survey of Canada, by Dr. M. C. Stopes. These deposits are now recognised as Carboniferous, though formerly described as Devonian, and consist of alternations of sandstones and shales, and it is in the shales that the rich flora of débris occurs. The shales contain impressions of Calamites, Cordaites, etc., and the plants have been for the most part described by Sir William Dawson. A new genus, Pteridospermostrobus is described, the plant being allied to the British Lagenostema, but the preservation is unforfunately very imperfect. The monograph is illustrated by a fine series of plates and useful text figures.

THE annual report of the Philippine Weather Bureau (parts 1 and 2), recently issued under the direction of the Rev. J. Algué, S.J., contains hourly observations made at the Manila Observatory during the calendar year 1912. There is but little variation in the mean values from year to year, and nothing exceptional occurred during the year in question beyond an increase in seismic activity; *e.g.* the annual departures from the normal of forty-eight years were, for temperature, −0·15° C.; rainfall, +3·8 mm.; it is therefore unnecessary to add to the remarks made in our previous issues. During the fiscal year 1911–12 the earthquakes reported from various parts of the archipelago numbered 230, 90 per cent. above the average. Only five of the shocks were severe; that of July 12, 1911, has been registered all over the world with the characteristics of a "great earthquake." The Manila seismographs recorded 318 disturbances. The relations with other services in the Far East have recently been much improved; the observations are now synchronous, and although not yet simultaneous, the construction of synoptic charts from available data is much more satisfactory.

In the *Museums Journal* for December Mr. Alan Pollard advocates the practical use of Cartesian co-ordinates for locating objects in a museum or other rectangular room. He suggests that a foot may be a convenient unit for the purpose, and that a rough scale may be sufficient for purposes of localisation, the *centre* of the object being the point specified. As it is necessary to specify which faces of the room are to be taken as co-ordinate planes, the author proposes, the wall containing the door by which the room is entered as plane of (x, z), and the wall to the left of this as plane of (y, z). For a line or plane parallel to one edge or face of the rooms, he proposes to specify numerically the given co-ordinates using letters for the indeterminate ones; for example $(x, 29, z)$ represents a wall 29 ft. from the plane of (x, z).

There is a growing tendency among postgraduate students, and indeed mathematical writers generally, to produce papers containing no new ideas, but merely clothing ideas already familiar to readers in slightly different form or notation. As examples we may illustrate the waste of university endowments on students who merely propose to express well-known formulæ of electrostatics or attractions by means of quaternions and elliptic functions. Mr. George Paswell contributes to the Bulletin of the American Mathematical Society for December "An Appeal to Producing Mathematicians" which we hope will be read in very great earnest by all teachers of advanced students and writers of papers. He points out that the profession of civil engineering is teeming with problems awaiting the solutions of a Laplace or a Newton, and he instances the theory of elasticity as requiring the most urgent attention. He further attacks the shallowness of the courses of mathematical instruction given to applied science candidates, and though his strictures apply particularly to America, it is equally true that in Great Britain candidates can obtain University degrees in engineering on work that is scarcely up to intermediate pass standard. A paper by Mr. Sidney Withington on the catenaries of one of the American trolley railways in the Journal of the Franklin Institute for December, 1914, illustrates this point well. The author on page 721 employs the binomial theorem with a reckless waste of neglected terms to prove or rather to fail to prove an obvious geometrical result which he can only accomplish by inserting or omitting a factor 2 from one or other of two quantities to be proved equal, the explanation of this factor being quite different from anything clearly and explicitly stated in the paper. While strongly supporting Mr. Paswell's plea, we greatly regret that he has omitted the subject most urgently requiring research at the present time, viz., aeroplanes. Aeroplane problems are running to waste by the dozen, and they practically never, or at best rarely, figure in mathematical transactions.

The *Electrician* for December 25, 1914, reproduces the provisional report of the committee of the Physical Society on Nomenclature and Symbols. Some of the most noteworthy features of the report are its proposal to use capitals for the amplitudes, and small letters for the instantaneous values of quantities varying harmonically; its restriction of the termination -ity to specific, and its use of the termination -ance for non-specific, properties. Thus we have the resistance, conductance, and inductance of an electric circuit, but the resistivity, conductivity, and permeability of the material of which it is composed. The term capacity of a condenser is, however, retained, and forms an exception which might be got rid of by the substitution of the word capacitance. In terrestrial magnetism and atmospheric electricity the terminologies are in a chaotic state, and the evil is not likely to be mitigated so long as colourless words like declination and inclination are adopted by theoretical writers for the effects graphically described by the words deviation of the compass and dip respectively. It is much to be desired that the various committees now considering the question of symbols should confer with each other in order if possible to introduce unanimity into their reports (see p. 544).

Under the title "Chemistry and Practical Life" has been reprinted an address delivered by Dr. G. T. Beilby before the Chemical Society of the Royal Technical College, Glasgow. Whilst fully recognising the great indebtedness of modern civilised society to science and its discoveries, Dr. Beilby emphasises the enormous debt which had already been incurred to the countless generations of workers who had lived and worked before the advent of chemical science. In reviewing the position of chemical industry in this country, a subject on which Dr. Beilby speaks with authority, it is pointed out that "long after the scientific development of chemical engineering was well under way in Germany, scientific and academic chemists completely ignored the necessity for this new hybrid, the 'chemical engineer,' or openly scoffed at the idea." Too frequently in the colleges of this country "there appears to be an absence of any real conviction that the call for instruction in chemical science with a deliberate view to its application in the development of the arts and industries is intrinsically sound from the intellectual as well as from the practical point of view." A letter by Mr. C. R. Darling in the Journal of the Society of Arts (December 18) emphasises in a similar way the fact that "if we are to have that co-ordination between the teacher and manufacturer that exists in Germany to the great advantage of both, the teaching of chemistry must not, as at present, be mainly confined to the cloister. We must either introduce courses of instruction in industrial chemistry into our existing colleges and universities, conducted by men of experience, or create new institutions for the purpose. So long as educational authorities regard the possession of a degree as the only criterion of ability, and form their staffs almost exclusively of men who have had no industrial experience, they will never give that effective assistance to the manufacturers which will enable us to hold our own in the sphere of chemical industry."

AMONG the various uses to which oils are put is their employment by electrical engineers for the insulation of oil-immersed transformers and for surrounding the breaking contacts of high-tension switches. Special qualities of oil are necessary and a good deal of research has been going on as to the selection and testing of suitable oils for these purposes. A quantity of information has been collected by a research subcommittee of the Institution of Electrical Engineers, and is embodied in a report just issued. The chief troubles are the deterioration of the oil by the gradual formation of sludge and the lowering of its quality as a dielectric by the absorption of moisture. This sludge now appears to be due to the formation of complex organic acids, dehydrogenated hydrocarbons, and oxidised resinous asphaltones of the mineral oil originally used. The formation of these compounds is accelerated by increase of temperature, and for testing purposes they can be rapidly produced by exposing the oil to ozone. The effect of sludging, although impeding the required circulation of oil in a transformer, does not affect its dielectric quality so much as the absorption of moisture, and this is so serious that the presence of a small percentage of water in the oil is more easily detected by electrical tests than by purely chemical methods.

HITHERTO the manufacture of the well-known antiseptic, thymol, has been practically confined to Germany, notwithstanding the fact that ajowan seeds, the oil from which is almost the sole source of commercial thymol, are grown on a large scale only in India, which has thus been supplying Germany with the raw material of a valuable industry. No further supplies of thymol being forthcoming from Germany owing to the war, the price had increased almost eight-fold by September last, and is even now 21*s*. 6*d* per lb., as against 5*s*. per lb. before the war. There is every reason why the United Kingdom should now become the chief centre of the manufacture of thymol. The manufacturing process is quite simple, and ample supplies of ajowan seed are available in India. The Imperial Institute, which has devoted attention to this subject, has now made inquiries in India, and is prepared to put intending British manufacturers of thymol in touch with Indian exporters of the seed. Fortunately, too, a British possession can provide a substitute for thymol if such be required. This substance is carvacrol, which is obtained from oils derived from a variety of plants, but particularly from the origanum of Cyprus. At the instance of the Imperial Institute this Cyprus origanum oil is already being produced in commercial quantities from wild plants in Cyprus, and in 1913 was exported thence to the United Kingdom to the value of 980*l*. It is believed that the plant can be cultivated profitably and on a large scale in Cyprus, and experiments in this direction are understood to have been begun.

THE first report of the Board of Trade Committee on bulkheads and water-tight compartments, presided over by Sir Archibald Denny, has now been issued, and forms the subject of the leading article in *Engineering* for January 8. The committee has now been at work for nearly two and a half years, and the first report deals with foreign-going steamers carrying more than twelve passengers. It is not possible even to mention all the points covered by this comprehensive report, but we note that the committee has given a clearly defined method for the construction of flooding curves and tables. Full calculations were made for several actual vessels of widely different types, and from these, together with the general laws governing flooding calculations, a method of preparing flooding curves from simple data was devised. The method was tested by applying it to a number of actual vessels, and comparing the results with those given by full flooding calculations for the same vessels. The Committee is right in claiming that the formulation and enforcement of rules governing subdivision is a contribution of the utmost importance to the subject of safety of life at sea.

WE have received an interesting pamphlet from the Bonecourt Waste Heat Boiler Co., Ltd., of Parliament Mansions, Westminster, in which is described a method of raising steam for power, heating, or other purposes by utilising the heat carried away in the products of combustion of internal-combustion engines and metallurgical furnaces. In general, the exhaust gases from an internal-combustion engine contain from 30 to 45 per cent. of the total heat available in the fuel supply, and these gases leave the engine at a fairly high temperature. In the Bonecourt system the exhaust gases from the engine are passed through internal tubes in a small steam boiler. At full engine load it is claimed that from 3 to 3·5 lb. of water can be evaporated from and at 100° C. per hour per brake-horse-power of the engine, with no additional cost for fuel. In other types of boiler made by the firm, both fuel firing in an ordinary grate and heating by exhaust gases are combined. Small tubes take the products of combustion from the coal-fired grate and separate larger tubes in the same boiler receive the engine exhaust gases. A boiler 7 ft. in diameter by 6 ft. long would be suitable for a 500 brake-horse-power gas engine, and would evaporate 1500 lb. of water an hour from and at 100° C. from the heat in the exhaust gases alone. Alternatively it would evaporate the same quantity when fired with coal alone, and if worked simultaneously by both methods, the evaporation would be about 3000 lb. an hour from and at 100° C. A large increase in efficiency is claimed by application of the system to open-hearth furnaces.

THE forty-second annual issue, that for 1915, of "Willing's Press Guide and Advertisers' Directory and Handbook" has been received. This yearly book of reference provides a concise and comprehensive index to the Press of the United Kingdom, a list of telegraphic news and reporting agencies, lists of the principal Colonial and foreign journals, and a variety of general information. A classified index of periodicals will prove of special interest to librarians, who, under such titles as "Chemical Science," "Geology," "Astronomy," "Philosophy," will find lists of magazines and journals devoted to different branches of science. The price of this useful "guide" is 1*s*.

OUR ASTRONOMICAL COLUMN.

FIREBALLS IN JANUARY.—Though January is by no means a month presenting special meteoric activity, it has furnished quite an unusual number of large fireballs. An analysis of the dates appears to show that the following periods are rather strikingly indicated:—

Principal Radiants.

Jan.	1–4	230° + 52°		
	9–13	57° − 12°	120° 0°	133° + 21°
	14–19	110° + 23°	130° + 33°	130° + 48°
	25–28	132° + 31°	160° + 58°	332° + 57°

The January fireballs deserve more careful observation and inquiry. There are evidently some rich showers involved, but it is very difficult from the limited state of our knowledge, to single out the richest systems from the large number which apparently supply our January meteors. Apart from the several radiants mentioned above, there are many others fairly well defined in Aries, Taurus, Perseus, Leo, Virgo, Gemini, and Ursa Major. The data already collected appear to prove that the prevalence of large meteors is due rather to a considerable number of showers than to the special activity of two or three, but the investigation can be carried still further when additional materials have accumulated.

THE CAPTURE THEORY OF SATELLITES.—Prof. T. J. J. See's volume entitled "Researches on the Evolution of the Stellar Systems" (vol. ii., "The Capture Theory"), is discussed by Dr. A. C. D. Crommelin in the current number of *Scientia* (vol. xvii., 1915.) Prof. See's contention is that the planets and satellites were independent of the solar system, and have never been evolved from what we consider their primaries, but that they have been captured from outside and made to conform to their present orbits under the secular action of a resisting medium. Dr. Crommelin holds to the view that the matter embodied in the planets was always a part of the solar system, but spread out in the form of huge dust clouds, which finally condensed round certain centres. It is in support of this view that the present article was written, and he brings forth many lines of argument which help to strengthen his view. Dr. Crommelin states that his conclusions do not imply any want of respect for Prof. See's contributions to astronomical theory, for "his suggestions are always stimulating and ultimately help on the attainment of the truth." The new light that the study of the spectroscopic binaries has shed on the question calls nevertheless for a modification of his views.

OBSERVATIONS OF THE MOON.—Prof. W. H. Pickering, in the November number of *Popular Astronomy* (vol. xxii., No. 9, 1914) described some interesting observations on the lunar crater Aristillus, and incidentally made some general statements which no doubt have attracted attention. He points out that nearly everyone who looks at the moon through a telescope confines his attention to those regions near the terminator because they furnish "striking views, are easily identified, and because what is seen is easy to understand." It is for this reason, he says, that the impression that the moon is lifeless has so long maintained its existence. According to him the only time when the moon is really interesting is when its surface is viewed far away from the terminator, that is, during the lunar summer time, for then changes are taking place, changes which are "conspicuous all over the surface to any who will take the trouble to watch and to study them carefully." Here, he suggests, is the opportunity for the amateur to come in, to make his observations and drawings with care, to record the times, compute the corresponding colongitudes, and to publish his results. The necessary observations do not require the highest grade of seeing nor the largest telescopes. Close observation has led Prof. Pickering to conclude that the moon is very far from being a dead planet, and he has advocated the existence of vegetation on the moon for more than twenty years; he hopes by means of the above assistance that his idea will gain ground, and that the textbooks of twenty years hence will not contain the statement that "the moon is without air, water, or vegetation."

COMPANION TO "THE OBSERVATORY" FOR 1915.—The Companion to *The Observatory* for the present year has just come to hand, and its contents are familiar to astronomers, both professional and amateur. The substance of the matter and its arrangement follows for the most part on the lines of former issues. One important alteration is the page devoted to meteor radiants. This year the principal radiant is given for each night during the year, as well as the average hourly number of meteors visible on a clear moonless night. This information is supplied by Mr. W. F. Denning from observations made between 1866 and 1914. Only two eclipses will occur during the year, and these are both annular eclipses of the sun; neither will be visible in Europe.

THE METEOR-FALL OF ENSISHEIM (1492).—A reprint from the Journal of the Royal Astronomical Society of Canada (September-October, 1914) contains some interesting historical references to the meteor-fall of Ensisheim, which occurred in Alsace in 1492. These notes have been brought together by Dr. C. A. Chant in the hope of clearing up several discrepancies between different authorities. According to Wulfing's work on meteorites in collections and literature, sixty-five museums are supposed to possess portions of this meteorite, the original weight being 127 kg. (279 lb.), of which 70·4 kg. have been located. Ensisheim is the fortunate possessor of 54·8 kg., which is preserved in the town hall.